UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
CHEMICAL SAFETY AND
POLLUTION PREVENTION

MEMORANDUM:

From: Kevin Sweeney, Senior Entomologist

Date: August 30, 2013

Subject: PRODUCT PERFORMANCE DATA EVALUATION RECORD

Task 121
DP barcode: 411478
Decision no.: 477707
Submission no: 933829
Action code: R340
Product Name: Bistar WT
EPA Reg. No or File Symbol: 279-3281
Formulation Type: Soluble concentrate
Ingredients statement from the label with PC codes included: 23.4% bifenthrin
Application rate(s) of product: None. Spray a 0.6% bifenthrin solution to the point of run-off. For dip-diffusion, application should result in 50 mg of bifenthrin per cubic meter.

Use pattern: wood treatment as a pre-treatment, post-construction remedial, and preventive treatments.

OCSPP/OPPTS Guidelines: non-guideline. OPPTS 810.3600 provides information useful to evaluation.

I. Action Requested: Review submitted label amendment and determine if submitted data support the changes.

II. Background: Registrant has reorganized the label and requested a 5-year protection claim based on a field study with the Formosan termite.

III. Study Review:

MRID 491042-01. B. L. Mount. F54800 Comparative Wood Treatment Efficacy Data Louisiana, 2013. Sept. 14, 2013.

Please see attached primary review.

Conclusion: The study is partially acceptable. The study shows that bifenthrin treated wood can reduce Formosan termite attack. The study was conducted over 5 years but termite feeding/attack pressure at the site was low as indicated by the untreated control data. In addition, the positive control Bora-Care had a higher level of attack than the untreated control. With a sample size of only 4 replicates per treatment and inconsistent monitoring results, the study data are not robust enough to substantiate further claims.

IV. ENTOMOLOGIST'S COMMENTS AND RECOMMENDATIONS:

1. The label changes are acceptable except for claims of "5 year control of termites". The data do not support that claim.
2. Significant changes to termiticide labeling that are accompanied by new data should be routed by the registrant to the ASPCRO Termiticide Label Review Committee for comment and review. These comments should be provided to EPA with the label amendment. EPA and ASPCRO have a MOU for this activity.

DATA EVALUATION RECORD

[EPA Primary Reviewer's Name]

STUDY TYPE:	OCSPP 810.3500 (Premises Treatments))
MRID:	**491042-01.** B.L. Mount. F54800 Comparative Wood Treatment Efficacy Data Louisiana, 2013. Sept. 14, 2013
DP BARCODE:	411478
DECISION NO:	477707
SUBMISSION NO:	933829
SPONSOR:	FMC Corporation 1735 Market St. Philadelphia, PA 19103
TESTING FACILITY:	New Orleans Mosquito and Termite Control Board
STUDY DIRECTOR:	B. Mount, FMC Corporation
SUBMITTER:	J. Holihan, FMC Corporation
STUDY COMPLETED:	09/09/2012
CONFIDENTIALITY CLAIMS:	None
GOOD LABORATORY PRACTICE:	"The study reported herein, "F54800 Comparative Wood Treatment Efficacy Data Louisiana, 2013 FMC Corporation, Agricultural Products Group, PDM 114-13 does not meet the requirements of the Good Laboratory Practice Standards set forth in Title 40, Part 160 of the Code of Federal Regulations of the United States of America. However, data and results contained in this report were obtained using credible experimental procedures and modern technology and thus are scientifically sound."
TEST MATERIAL:	PRODUCT NAME: Bistar® WT Insecticide EPA REGISTRATION NUMBER OR FILE SYMBOL: 279-3281 ACTIVE INGREDIENT NAMES: Bifenthrin

	CHEMICAL NAME: (2-methyl[1,1'-biphenyl]-3-yl)methyl 3-(2-chloro-3,3,3-trifluoro-propenyl)-2,2-dimethylcyclopropanecarboxylate; A.I. %: 23.34% PC CODES: 128825 CAS NO.: 82657-04-3 FORMULATION TYPE: Liquid spray PRODUCT APPLICATION RATE(S): For application to wood exposed to soil or structural foundations: must be applied at a minimum rate of 8 oz. per 2.5 gallons of water (0.6% solution) to the point of surface saturation so that the final wood residue meets or exceeds the minimum requirement of 50 mg bifenthrin/m^2. ACTIVE INGREDIENT APPLICATION RATE(S) g/m^2: 50 mg bifenthrin/m^2.
PROPOSED LABEL MARKETING CLAIMS:	Prevents termite damage to treated wood products for up to 5 years.

STUDY REVIEW

Purpose: To test the efficacy of the label product at preventing termite damage in newly constructed treated wood structures for up to 5 years.

MATERIALS AND METHODS

Test Location: Audubon Zoo, New Orleans, Louisiana.

Test Material(s): Bistar WT (23.34% bifenthrin solution). Bora-Care® Termiticide Insecticide and Fungicide Concentrate (40%) used as reference compound. Bistar WT has a label concentration of 23.4% bifenthrin.

Test Species Name, Life Stage, Sex and Age: Termites (*Coptotermes formosanus*), natural populations.

Describe test containers, chambers and/or apparatus (include site description and location) and how experiment was conducted: Treatments and water control were made to newly constructed wooden sheds approximately 5ft x 3ft rectangles on a concrete slab. Pressure-treated 2x4s were used as sill plates. Concrete slabs were 4 inches thick with one plumbing penetration in the center. Studs and framing were made from 2x4 southern pine. One-half inch plywood was used as the siding and roof. All sheds had four in-ground termite monitors installed around them. Treatments were made from the ground level up to 24 inches high on the interior and exterior of the sheds. The sheds were inspected approximately every 60-90 days for a five-year period.

List the treatments including untreated control (express application rate as g/m^2): 0.6% solution of Bistar WT applied to the wood surfaces until the point of run-off. One-to-one dilution of 40% Bora-Care. Controls were sprayed with water.

Number of replicates per treatment: 4 replicates (structures) per treatment and 4 control structures.

Number of individuals per replicate: N/A

Length of exposure to treatment (time in seconds, minutes or hours): 5 years.

Were tested specimens transferred to clean containers? N/A

Experimental conditions (state relative humidity, temperature, and photoperiod): The environmental conditions of the trial over the five-year span were normal for New Orleans, Louisiana. There were varying levels of rain-fall and humidity. No other information provided.

Data or endpoints collected/recorded: Termite damage was recorded during each site visit using the Gulfport scale used by the Gulfport Termite Control Board.

Data analysis: Ratings were averaged for the four replicates for each treatment.

RESULTS

Raw inspection data for each structure at each observation time were included in Appendix 1 of MRID 491042-01. The protocol is included as Appendix 2 of MRID 491042-01. The results of the 5-year trial are summarized in Table 1 below.

Table 1. Summary of Inspections in which Treated and Control Sheds were Rated according to the Gulfport scale used by the Gulfport Termite Control Board.

		Bora-Care Sheds					F54800 Sheds					Control Sheds				
		# 1	# 2	# 3	# 4	Ave	# 5	# 6	# 7	# 8	Ave	# 9	# 10	# 11	# 12	Ave
1-year after treatment	Active Monitors*	2	1	2	2	1.75	1	1	0	2	1.00	0	1	0	0	0.25
	Shed active	Yes	Yes	Yes	No	NA	No	No	No	No	NA	No	No	No	No	NA
	# of Mud Tubes	2	6	1	0	2.25	0	0	0	0	0.00	0	0	0	0	0.00
	Damage Rating	1	1	1	1	1.00	0	0	0	0	0.00	1	1	0	0	0.50
2-year after treatment	Active Monitors	3	4	4	4	3.75	4	1	3	4	3.00	1	4	3	0	2.00
	Shed active	Yes	Yes	Yes	Yes	NA	No	Yes	No	No	NA	No	Yes	No	No	NA
	# of Mud Tubes	3	1	1	1	1.50	0	1	0	0	0.25	0	4	0	0	1.00
	Damage Rating	2	1	2	1	1.50	0	1	0	0	0.25	2	2	0	0	1.00
3-year after treatment	Active Monitors	0	3	4	4	2.75	3	0	3	4	2.50	3	4	4	4	3.75
	Shed active	No	No	No	No	NA	No	No	No	No	NA	No	Yes	No	No	NA
	# of Mud Tubes	0	0	0	0	0.00	0	0	0	0	0.00	0	2	0	0	0.50
	Damage Rating	3	3	3	2	2.75	0	1	0	0	0.25	3	3	0	0	1.50
4-year after treatment	Active Monitors	0	3	0	3	1.50	4	0	1	0	1.25	0	4	1	1	1.50
	Shed active	Yes	Yes	Yes	Yes	NA	No	No	No	No	NA	Yes	Yes	No	No	NA
	# of Mud Tubes	0	0	0	0	0.00	0	0	0	0	0.00	0	0	1	0	0.25
	Damage Rating	4	5	5	2	4.00	0	1	0	0	0.25	4	4	0	1	2.25
5-year after treatment	Active Monitors	0	2	3	1	1.50	4	1	2	2	2.25	0	2	1	2	1.25
	Shed active	Yes	Yes	Yes	Yes	NA	No	No	No	No	NA	Yes	Yes	No	No	NA
	# of Mud Tubes	0	0	0	0	0.00	0	0	0	0	0.00	0	0	1	0	0.25
	Damage Rating	5	5	5	3	4.50	0	1	0	0	0.25	5	5	2	3	3.75

*Numerous monitors sitting in standing water & abandoned on this date

Gulfport damage rating scale:

0 = no attack
1= nibbles to surface etching; no penetration
2 = Penetration; limited damage
3= General attack
4 = Heavy attack
5 = Destroyed

Study Author's Conclusions

The earliest sign of any activity in the F54800 treated sheds was at 113 days after treatment. This consisted of a single inactive mud tube in one shed (shed # 6). The tube was abandoned and no live termites or damage was noted. The tube could be characterized as exploratory in nature. The treatment prevented attack by *C. formosanus* in 3 out of 4 sheds throughout 24 months. Shed #6 had a single mud tube with active termites above the treatment zone at the 24-month after treatment inspection. Damage was limited to surface etching/scarring behind the wood inspection panel door. In-ground monitors had heavy attack throughout the duration of the study reflecting heavy termite populations in the soil. By five years after treatment none of the F54800 sheds had active termites. Damage was limited to the minor surface etching/scarring seen in the two year after treatment inspection of shed # 6. Damage and infestation ceased and remained as only minor surface scarring to the wood in a small (less than 12 square area inch area) near the access panel.

Three of the F54800 treated sheds were never attacked and scored a 0 damage rating using the Gulfport rating scale. Shed # 6 scored a 1 with minor surface scarring in the area described above.

The water-treated structures and the structures treated with the reference substance (Bora-Care®) all showed extensive termite damage.

Reviewer's Conclusions

The number of study replicates was limited and results were presented in raw form without a statistical analysis. Termite pressure was inconsistent at control structures and not all of their monitoring devices were attacked by termites every year. Only one termite species was tested. Furthermore, termites were present at the treated structures and did cause some damage.

In general, the results support the conclusions of the study author in that there was only minimal damage in only one of the 4 (25%) structures treated with F-54800 after five years. However, the test protocol (page 34 of MRID 491042-01) states that "there should be no infestation in a minimum of 90% of the test structures for five years." To obtain a more accurate estimate of this level of control, it would have been more appropriate to use a much larger sample size. The USDA-FS uses a minimum of 10 for their field plots but tests conducted at with structures generally require a larger sample size due to the increased variability. Based on the presented results, the level of success was 75% or less depending on control activity or lack of it is corrected for.

NOTE: The label application rate is 50 mg bifenthrin/m^2; however, it was not verified by quantitative analysis that this was the level of application used in the study. Unlike borates, which are inert, bifenthrin does breakdown over time into compounds that have n o termite activity. The results present bioassay results but wood was not analyzed to show that bifenthrin was actually present in or on the wood each year.

Reviewer's Recommendations

These data show that bifenthrin treated wood can kill Formosan termites and reduce their attack. The study does not substantiate a 5-year protection claim.